

REMARKS

Claims 53-96 are pending and stand rejected. Claims 53 and 91 have been amended. Claims 54-90 and 92-96 are dependent on amended independent claims 53 and 91, respectively.

Claims 53 and 91 stand rejected under 35 USC 101 as lacking in tangible and useful result. The Examiner has said that these claims are merely using a computer to implement abstract concepts, such as ranking factors, and that the result is abstract and not a real world, tangible result.

Claim 53 has been amended to clarify a claimed result which is a tangible, non-abstract, real world result. In particular, claim 53 now claims a method which produces a ranked, indexed database of words and related pages for producing ranked results in response to a search query. Claim 91 now claims building a searchable database indexed in accordance with selected words for producing a ranked set of search results in response to a query. As amended, independent claims 53 and 91 claim a new and useful process or improvement thereof as required for patentability under 35 USC 101.

Claims 53 and 91 stand objected to for formalities. In particular, the Examiner has indicated that "and" should be removed after "selected page" in line 4 of claim 53. Claim 53 has been amended to correct this typographical error. The Examiner has also indicated that the semicolon ";" should be replaced with a comma "," after the words "factor for that page" at line 14. Claim 91 has been amended to correct this typographical error.

Claims 53-96 stand rejected under 35 USC 103(a) as obvious over Bharat in view of Page. Applicants respectfully traverses these rejections for the reasons discussed below.

With respect to claim 53, Bharat is said to teach a computer-implemented method of ranking the relevancy of pages by scoring each page based on the "hub" and "authority" for that page in the result set from a keyword search query producing the collection of pages by determining hub rank as

an intrinsic ranking factor and determining hub rank as an extrinsic ranking factor. Applicant respectfully traverses.

Applicant notes with appreciation that the examiner has held that Bharat does not teach a method of determining and/or combining intrinsic and extrinsic factors for ranking.

As described in Bharat, the hub rank of a page is a measure of connectivity in that there are many outbound links from a "hub" page. The authority rank of a page is a measure of connectivity in that there are many inbound links to an "authority" page. Scoring can be iterated so that hubs are scored as better hubs when they are pointed to by many good authorities and authorities are scored as better authorities when they are pointed at by better hubs.

In any event, hubs are not ranked by content of the page but rather by connectivity, i.e. the number of links. Further, better hubs are not ranked by the content of the authority pages nor are better authority pages ranked the content of the hub pages. Hub and authority ranking is by connectivity, the number of links from authority pages which have links from other hubs.

Bharat teaches the collection of results from a query applied to the Web to produce a start set, scoring nodes in the start set for a) connectivity based on the total number of directed edges (links) to and from a node and b) content based on the number of uses of the query term on that node. See col. 3, lines 6-15. A subset of 30 documents in the start set is selected to form an expanded query topic by concatenating the first 1000 words of the 30 documents. See col. 3, lines 16-20. During a subsequent content analysis phase, a relevance weight is assigned to each page based on similarity to the expanded query set and increased for use of the query terms. The nodes are then pruned for relevance. See col. 3, lines 21-27. During a further connectivity phase, the remaining nodes are analyzed and ranked based on hub and authority scores. See col. 3, line 31-35. The content and connectivity phases may be iterated. See col. 3, lines 36-45.

Bharat teaches a method which includes content analysis as well as connectivity analysis to improve ranking in a result set retrieved from an index 141 of web pages. The search result set 112 from search engine 140 is intercepted and used as the start set. See col. 4, lines 29-33. The first step is a content analysis and the subsequent step is connectivity analysis by a hub and authority algorithm. These steps which may be iterated to produce a convergent ranking by first improving the ranking for content and then improving the ranking by connectivity.

This iterative process of determining content and then connectivity does not teach or suggest the use of a method as claimed in claim 53 in which the relevancy of a selected page is ranked by combining a content analysis of the selected page and a content analysis of pages having outbound links to the selected page. The claimed method produces a ranked and indexed database of words, together with related ranked pages, which can then be searched to produce ranked search results. The Bharat approach requires the interception of search results for an iterative content and then connectivity analysis so that the time required for a searcher to retrieve search results is necessarily delayed beyond the time required to obtain the start set of search results. On the other hand, the method as claimed produces a ranked database indexed by words and searchable to produce already ranked search results. One of the substantial unobvious advantages over Bharat available from the claimed method is that the content and connectivity analysis can be performed before the query is applied to the collection of pages.

Page is said to teach determining relevance from intrinsic and extrinsic factors and combining the ranking factors. Further, at col. 2 lines 51-60, Page points out that relevance can be determined from the intrinsic content of the documents or from the anchor text of backlinks to the documents but teaches away from only using these factors to teach a method which determines the importance from extrinsic relationships between documents. Page is also said to teach combining ranking factors.

Page teaches that once a set of documents is identified that match the search terms, the list may be sorted by a function which combines factors such as objective and textual ranking. The techniques taught by Page are related to the probability that a random web surfer finds a particular page after following a large number of links. See col. 3, lines 10-13. This technique is similarly the same as the page weighting factor recited in dependent claims 54, 55, 57, 65, 66 and 91.

Page and Bharat therefore teach the ranking of documents after the set of documents is produced by applying a search term to a large database such as the Web. Bharat teaches adjusting the set of documents by iterative context and connectivity analysis followed by a hub and authority analysis. Page teaches determining the page weighting from extrinsic relationships between documents and that ranking factors can be combined. However, nothing in Bharat or Page individually or taken in combination renders obvious the ranking the relevancy of words on the

pages of a collection to produce a database indexed by the words and searchable to produce ranked search results in response to a search query nor ranking performed by combining an intrinsic ranking factor determined by a content analysis of a selected page based on the number of uses of a selected word on the selected page with an extrinsic ranking factor determined, for each linking page containing an outbound link to the selected page, by a content analysis based on the number of uses of the selected word on the linking page as claimed in claim 53.

Further, nothing in Bharat or Page teaches adjusting the intrinsic ranking factor for page weighting as claimed in claim 54, adjusting the extrinsic ranking factor for page weighting as claimed in claims 55 and 57, deriving the page weighting factor for each selected page as claimed in claim 65 and 66, for each page of a collection of pages including hypertext linking pages and/or determining a page weighting factor related to a probability of a user viewing said each page as a result of viewing pages in a random fashion in the collection as claimed in claim 91.

Claims 54-90 and 92-96 are dependent on independent claims 53 and 91 which as noted above are not obvious over Bharat, Page or the combination of these references.

Regarding claims 54, 55, 57, 65, 66 and 91, Bharat is said to teach adjusting the ranking factor for a page weighting factor. Applicant respectfully traverses because nothing in the sections cited by the Examiner teach any adjustments for page weighting which is related to a probability of a user viewing said each page as a result of viewing pages in a random fashion. Bharat teaches the use of a modified Kleinberg hub and ranking algorithm, but the modifications are not for page viewing probability.

Regarding claims 56, 58, 59 Bharat is said to teach adjusting a ranking factor for a link weighting factor. Applicant respectfully traverses because nothing in the sections cited by the Examiner teach any adjustments for link weighting. Bharat teaches the use of a modified Kleinberg hub and ranking algorithm, but the modifications are not for link weighting.

Regarding claims 60, 61 Bharat is said to teach determining use of a selected word in the outbound link or in the vicinity of the outbound link. Applicant respectfully traverses because nothing in the sections cited by the Examiner teach use of a selected word in the link or its vicinity. Bharat teaches the use of linked pages to expand the start set.

Regarding claims 63, 64 Bharat is said to teach ranking pages for selected words, forming an indexed database including ranked data and responding to a query with ranked result pages. Applicant respectfully traverses because nothing in the sections cited by the Examiner teach the creation of an indexed, ranked database which responds to a query with ranked results. As noted above, Bharat teaches intercepting the result set from a search query to rank the data by connectivity, content and hub and authority analysis before allowing the results to be provided to the searcher.

Regarding claims 66 and 91, the Examiner has held that it would have been obvious to combine the teachings of Bharat with the teachings of Page to combine the ranking factors disclosed into the system of Bharat to estimate the amount of attention a page receives on the web because Page teaches viewing the document. Applicant respectfully traverses because viewing of the pages does not teach or suggest using a reservoir of bi-directional links to determine page weighting probabilities.

With regard to claim 67 - 90 Bharat is said to teach determining a frequency of use of a word, the location of a word, comparison of words, the manner of usage of words, the size of a paragraph, adjusting the intrinsic ranking factor for proximity between at least two words, word order and adjusting ranking in accordance with words in the vicinity of the outbound link. Applicant was unable to find any reference to such teachings in the sections cited by the Examiner.

If these rejections are maintained, Applicant respectfully requests that the Examiner provide greater specificity in these rejections, in accordance with the requirements of the MPEP, so that Applicant can understand them and respond. In any event, nothing in Bharat teaches the functions specified above to create a ranked, index database which produces ranked search results in response to a query as claimed in independent claim 53 from which these claims depend.

Regarding claim 91, the Examiner has held that it would have been obvious to combine Bharat and Page. As noted above, the combination would not render obvious the creation of a searchable database indexed in accordance with the selected words for producing a ranked set of search results in response to a query as claimed in claim 91 because both Bharat and Page teach ranking a result set produced by a query rather than pre ranking words with links to the pages.

Claims 92-96 are dependent on independent claim 91. Nothing in Bharat, Page or the combination of these references teaches ranking a search database index as claimed in claim 91

further adjusting the anchor text scores for the number of outbound links as claimed in claim 92, forming databases of relevance rankings and searching them as claimed in claims 93 and 94, adjusting the ranking in accordance with proximity as claimed claim 95 or in accordance with word order as claimed in claim 96.

Nothing in Bharat or Page taken singly or in combination renders obvious the use in a computer-implemented method of ranking the relevancy of words on pages in a crawled collection of web pages to produce a database indexed by words and searchable to produce ranked search results in response to a search query where the ranking is the combination an intrinsic ranking factor determined by a content analysis of a selected page based on the number of uses of at least one selected word of text on the selected page with an extrinsic ranking factor for each linking page containing an outbound link to the selected page, by a content analysis of each linking page, based on the number of uses of the selected word on the linking page combined with

- Adjusting the intrinsic factor in accordance with the page weight of the selected page as claimed in claim 54.
- Adjusting the extrinsic factor in accordance with the page weight of a page linking to the selected page as claimed in claims 55 and 57.
- Adjusting the extrinsic factor for a link weighting factor related to a quantity of outbound links on the linking page as claimed in claims 56, 58 and 59.
- Wherein determining the extrinsic factor includes:
 - determining the use of the selected word in the outbound link on the page linking to the selected page as claimed in claim 60,
 - determining the use of the selected word in the vicinity of the outbound link on the page linking to the selected page, as claimed in claim 61.
- Wherein the selected word is related to a query as claimed in claim 62.
- Ranking each selected page for each selected word, forming databases related to the rankings and responding to a query with pages ranked in accordance with the databases as claimed in claim 63.
- Indexing the databases in accordance with the selected words as claimed in claim 64.

- Forming databases by determining content, extracting links and deriving page weighting factors for the selected pages as claimed in claim 65.
- Using a reservoir of bi-directional links to determine page weighting as claimed in claim 66.
- Determining a frequency of use of the selected word as claimed in claim 67.
- Determining a location of the selected word as claimed in claims 68 and 70.
- Determining use of the selected word compared to other words as claimed in claims 69, 71 and 72.
- Determining the size of the paragraph on the linking page using the selected word as claimed in claim 73.
- Adjusting the intrinsic ranking factor for proximity between at least two of the plurality of selected words on the selected page as claimed in claim 74.
- Adjusting the intrinsic ranking factor for word order between at least two of the plurality of selected words on the selected page as claimed in claims 75 and 76.
- Determining the extrinsic ranking factor for use of a plurality of selected words in the vicinity of the outbound link each linking page as claimed in claim 77 and 81.
- Adjusting the extrinsic ranking factor for proximity between at least two of the plurality of selected words on the linking page as claimed in claim 78.
- Adjusting the extrinsic ranking factor for word order between at least two of the plurality of selected words on the linking page as claimed in claims 79 and 80.
- Adjusting the ranking of the selected page in accordance with proximity between at least two of the plurality of selected words as claimed in claim 82.
- Adjusting the ranking of the selected page in accordance with word order between at least two of the plurality of selected words as claimed in claims 83 and 84.
- Determining a frequency of use of the plurality of selected words and adjusting the relevant factor for proximity or word order as claimed in claims 85-87.
- Determining a location of use of the plurality of selected words and adjusting the relevant factor in accordance with the relative locations of at least two words as claimed in claim 88.

- Determining use of the plurality of selected words on the selected page, compared to use of other words on the selected page, and adjusting the intrinsic ranking factor for proximity or word order as claimed in claims 89 and 90.

Nothing in Bharat or Page taken singly or in combination renders obvious the use in a computer-implemented method computer implemented method of ranking the relevancy of pages in a collection of pages including hypertext linking pages of determining a page weighting factor, a content score for the use of each one of a plurality of selected words on said each page, and an anchor text content score, for each of the plurality of selected words, related to the use of one or more of the plurality of selected words in association with an outbound link on said each page to another page in the collection and ranking the relevancy of each page in accordance with the content score for that page adjusted in accordance with the page weighting factor for that page and the anchor text score for each linking page having an outbound link to that page adjusted in accordance with a page weighting factor for that linking page and building a searchable database indexed in accordance with the selected words for producing a ranked set of search results in response to a query as claimed in independent claim 91 together with:

- Adjusting said anchor text scores for each linking page in accordance the number of outbound links on that linking page as claimed in claim 92.
- Forming databases of the relevance rankings and searching the databases to respond to a query with a result set of pages ranked for use of one or more of the selected words as claimed in claim 93 and/or adjusting the ranking for proximity or word order as claimed in claims 95 and 96.

Applicants respectfully request that the rejections be reconsidered in light of the amendments and arguments presented herein and the case be passed to issue.

Respectfully submitted,

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